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Exposing Nuclear Power Plants

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This paper will begin by outlining the eco-justice topic of nuclear power and its resulting nuclear waste, and then move on to examining and making claims about the justice (distributive, procedural, and recognition-based), evidence, and process behind the development and decommissioning of these plants. Through this, we will discover historical and present ties to racism - especially as we explore the relationship between nuclear power and the white racial frame, resulting in the objectification, oppression, and suppression of the voices of Indigenous communities and people of color throughout history and into the present moment.

After addressing and reflecting on many of the harmful ways nuclear reactors affect us, our nonhuman counterparts, and our environment, we will analyze Indigenous perspectives on the current state and future of nuclear power. Finally, I will present a variety of solutions for changing an industry that does far more harm than good for the planet we call home. Nuclear power stations - active, decommissioned, and at every stage in between - are environmentally and ethically unjust because of the direct and indirect harm they inflict upon humans, animals, and our shared environment, and their regulatory policies need reformation.

Introduction

Where does our electricity come from? In the United States, about a fifth of all electricity produced comes from nuclear power plants. In fact, the US generates more nuclear power than any other country in the world, and by more than double. While statistical information like this is generally accessible to the public, what goes on behind the scenes at these nuclear power plants continues to be intentionally well-hidden from us, the consumers. Further, the effects of these underground operations and decisions made behind our backs are not only detrimental to communities within proximity of the plants, but to everyone, including the generations to come. In essence, this paper seeks to expose the truths behind nuclear power plants - not only the harm

they unequally subject humans, nonhumans, and our shared environment to, but also the procedural injustices that form their backbone and that aren't always made public. In this way, we will expose nuclear power plants for what they truly are, for all that they perpetrate, and for what they ultimately exemplify.

Before diving into the injustices brought about by nuclear power plants, we first have to understand how these systems function. Energy comes in a variety of forms, each with associated advantages and disadvantages. One such form of energy prevalent in the world since the 1950s is known as nuclear energy, which is generated when heat is extracted from the process of nuclear fission, nuclear decay, or nuclear fusion, with the ability to perform work. Nuclear power plants, the main avenue through which nuclear energy is used to produce electricity in the world, typically utilize the heat released from the process of nuclear fission. Nuclear decay, on the other hand, is the process that nuclear waste (a product of nuclear power plants) undergoes as it loses energy in the form of radiation - which when released is very harmful to all forms of life. Furthermore, used nuclear fuel materials, known as rods, have to be properly contained for years after they are spent - a procedure that is not usually honored, and therefore extremely detrimental to surrounding communities upon inevitable exposure. While nuclear power plants do not produce greenhouse gases, they are dependent on the nonrenewable resource of Uranium (the mining of which is environmentally damaging), they produce radioactive waste which leads to significant storage challenges and poses serious health risks when exposed, and they require large amounts of water (also at a demonstrated risk of pollution) for cooling purposes. In order to fully understand the extent to which the development, implementation, and decommissioning of nuclear power plants affect us at this very moment and will continue to affect us throughout our lifetimes, we will first look at scientific and ecological evidence of their multifaceted destruction, and then explore several claims of injustice, corresponding documented evidence, and compare agreed upon versus followed processes at the plants themselves.

Environmental Science

Nuclear power plants generate low-level radiation, high-level radioactive waste, and are prone to causing devastating and far-reaching contamination. The disastrous potential of these

plants has already been demonstrated in the United States (the Three Mile Island in 1979), in Russia (Chernobyl in 1986), in Japan (Fukushima in 2011), and in various other countries worldwide. The primary concern, a commonality among all nuclear reactor disasters, is that radioactive particles escape from the plant's containment devices and enter the environment. European studies indicate that "elevated childhood leukemia rates, among other diseases, are associated with proximity to reactor sites" (Kyne and Bolin). In fact, a German study discussed by Kyne and Bolin reported that children under five years old living within 3 miles of nuclear power plants are more than twice as likely to develop leukemia than those residing outside of this zone. However, the toxic elements released by these reactors do not only affect immediate communities. Following the Fukushima catastrophe, for example, "even miles away in the Tokyo metropolitan area, a citizens' group found Cesium-137 hot spots in the soil, with radiation levels comparable to those in the Chernobyl exclusionary and radiation control areas" (Jenkins, Alvaraz, and Jordaan). This is evidence of nuclear reactors "operating outside their approved licensing parameters in an unanalyzed, unlicensed condition" (Gundersen). When considering the already disadvantaged communities (low income and minority groups) that these plants have been purposefully placed by and around, it is hard not to recognize the many patterns of injustice as well as powerful evidence of environmental racism (a term we will explore soon) that these harmful systems perpetrate. The pervasiveness and harm brought about by nuclear power plants does not stop where the land meets the ocean though, nor does it only affect those who currently reside on the land.

Imagine swimming in the ocean when a large, crashing wave hurls towards you and forces you to dive underneath the whitewater in hopes of finding safety. Once under the wave, you feel a strong downward current pull you into the depths and darkness of the sea. Unable to see, and now trapped inside of a capped tube, you spend the remaining moments of your life decomposing into unidentifiable matter as radioactive particles penetrate your body. As described by Kuo Pao-Tsin, this exact process is what happens to sea turtles and other marine organisms living near nuclear reactors along the coast, which depend on the ocean water to cool their structures. Therefore, not only are the lives of humans put in severe harm's way by nuclear power plants, but our nonhuman counterparts and the environment we share also pay a

significant price. This cost is not evenly distributed though, as the "nuclear fuel chain is connected to a longer history of colonization and the environmental dispossession of Indigenous Peoples from their lands" (Weatherdon). The Marshall Islands, for example, became a testing ground for the detonation of 67 nuclear weapons developed by the United States for use in World War II. Marshallese people, the vast majority of which identified themselves as members of an Indigenous community, were not warned that their land was going to be taken from them, and were instead told that the United States would protect them from any harm that might come their way. The true intent of the U.S. decision makers was clear though, after over 400,000 premature deaths of Indigenous people and generations of babies born without bones or skin took place. A spatial expansion of colonialism, not only have the lands of Indigenous communities been forcefully taken away from them in order for nuclear power systems to materialize, but "in the United States, Native-American uranium miners, e.g. Navajos, face 14 times the normal lung-cancer risk" (Alldred and Shrader-Frechette). Further, there is no economic incentive to deal with this issue because "electricity generation - like any sector - is a money-making game, whereas dealing with [nuclear] waste is costly" (Jenkins, Alvaraz, and Jordaan). Nuclear colonialism is a type of environmental injustice that perpetuates environmental racism, a term mentioned earlier that "'combines with public policies and industry practices to provide benefits for whites while shifting costs to people of color'" (Endres, Local Environment). In order to further understand the many ways in which nuclear power systems are racist and the countless environmental injustices they uphold (as evidenced by the scientific data presented in this segment), let's clarify our definition of racism and explore distributive, procedural, and recognition-based justice claims pertaining to nuclear reactors.

Environmental Justice

As we view justice from a few different perspectives, a shared pattern of colonialism, oppression, suppression, and ultimately racism reveals itself. In order to recognize the many ways in which racism is perpetuated by the multidimensionality of this pattern, and without inflating or deflating its meaning, it is important that we first add on to our understanding of environmental racism by establishing clear definitions for both structural racism and the white

racial frame (a dominant worldview that contributes to the denial of the reality of racism in the world). To begin, structural racism operates dynamically and can be described by the institutionalized economic and social resource inequalities, institutionalized political marginalization, and institutionalized racial ideologies (set of racialized stereotypes), all of which can be traced along racial lines (Carter). A common perspective in the United States that furthers not only structural racism, but all forms of racism, is known as the white racial frame. This term can be defined as "an overarching white worldview that encompasses a broad and persisting set of racial stereotypes, prejudices, ideologies, images, interpretations and narratives, emotions, and reactions to language accents, as well as racialized inclinations to discriminate" (Feagin). As we work on identifying and understanding the pervasiveness of this framework, it is important to simultaneously and actively avoid succumbing to racial exceptionalism, or believing that racism only exists outside of ourselves. With that said, nuclear power systems are not only forms and extensions of environmental racism and structural racism, but they themselves are racist. Now we will turn to three different, but interconnected, justice perspectives where the pattern of colonialism, oppression, and the further suppression of marginalized voices reveals itself.

From a distributive point of view, justice can be defined in terms of how resources, as well as harm and risk, are shared. Not only are children, minority groups, low-income communities, and local marine life disproportionately affected by the placement of nuclear power plants, but the communities living on and near land containing uranium - a material required by these reactors - are also unjustly harmed. "Within the USA, approximately 66% of the known Uranium deposits are on reservation lands, as much as 80% are on treaty-guaranteed land and up to 90% of Uranium mining and milling occurs on or adjacent to Native American land" (Endres, Local Environment). Additionally, land that is mined for uranium can never again be used to grow crops or raise animals because of resultant and persisting nuclear radiation. This means that once the decision is made to dedicate a piece of land to the colonial expansion of nuclear power, the area will not be able to return to its original condition within the same lifetime, or even several generations after it is closed. Even though uranium is considered sacred by many Indigenous communities, it is unjustly stolen from them as their land is taken, stripped of nutrients, and ultimately destroyed for them, their grandchildren, great grandchildren, and

beyond, without their consent. Therefore, both the placement of nuclear power plants and the extraction of the materials required for their operation are forms of colonialism, environmental racism, and structural racism.

Another way to understand nuclear power plants as a form of injustice is from a procedural perspective, which describes justice as "the ways in which decisions are made, who is involved, and who has influence" (Walker). When studying the existing governmental practices and regulations on these reactors, it is important to pay attention to the wording of their presiding legal documents. One U.S. federal law that describes the process of renewing licenses for nuclear power plants is known as the Atomic Energy Act, which authorizes the Nuclear Regulatory Committee to issue and renew plant licenses. Meanwhile, the same law states that the public is merely "encouraged" to participate in the development and usage of atomic energy. Besides this vague statement, representation from those not in power is not stated anywhere else in the law, and is therefore not a requirement. Without any guidelines for participation, the "public" is left out of any and all important discussions about the future of these reactors, and ultimately is not invited to the conversation. As a result, over 95% of U.S. commercial nuclear reactor licenses have been renewed at least once, repeating the cycle of colonialism. Further, out of every senior nuclear policy position in the U.S. government since the 1970s, only twelve percent have identified as women. Of that twelve percent, only two percent have identified as women of color. A lack of representation from women (specifically women of color), people of color, and marginalized communities when decisions are made is a serious injustice and form of racism maintained by nuclear systems.

To further the idea that nuclear power systems serve as agents of racist colonialism, let's bring in the concept of recognition-based justice. This approach identifies justice "in terms of who is given respect and who is and isn't valued" (Walker). After being kicked off of their own land and unable to return, many Indigenous folks are forced to work as uranium miners - destroying the land they once cultivated - out of economic necessity. However, even working for the system that actively oppresses them does not grant them a voice, much less a seat at any table. Instead, "US nuclear-facility owners legally may expose workers to annual radiation doses up to 50 times higher than those allowed for members of the public...yet radiation workers

typically receive no hazard pay or compensating wage differential" (Alldred and Shrader-Frechette). Ultimately, justice in the form of representation (for marginalized groups) is almost non-existent when it comes to nuclear power systems because the underlying goal of those in power is to maintain their dominant positionality, to eliminate anyone and everyone that might stand in their way, and fundamentally, to further the agenda of the white racial frame. All of this evidence demonstrates that not only is the physical presence of those most directly affected by colonial efforts (in this case the implementation of nuclear reactors) not welcome to any of the tables where decisions are made, but their voices are also the least considered during the process. Further pushed to the margins of society, those most affected by nuclear colonialism are unjustly oppressed to the furthest extent of the law.

Environmental Ethics

The way in which Indigenous spirituality is treated in public discourse, environmental management settings, and in general, ought to be of critical importance to all people of faith because it is a central part of contemporary political movements (especially in North America), it can play an extensive role in addressing issues that affect the public at large, and it can compliment faith practices by facilitating even deeper connections with our shared environment. Critics of Indigenous spiritualities often argue that this form of religion is counteractive to (and less important than) other systems of faith because they believe that it is entirely an individualized and private practice, and therefore not a true religion at all. However, this approach is not only divisive, dismissive, and disparaging, it is also deeply rooted in white supremacy and colonial efforts such as intersectional oppression. Native Americans, a racially configured other, have historically been presented as a threat to settler-colonial projects due to their continued occupation of lands and claims to sovereignty. In essence, Indigenous communities are seen as standing in the way - between land and settler-colonial "conquerors." In order to challenge this perception, "we are called to the work of righting the historical narrative so that the suffering and trauma of Indigenous and enslaved peoples are not only acknowledged but respected…[we] must engage in a sustained process of truth telling" (Nessan). Further, these truths should come from those most impacted - from the Indigenous Peoples themselves.

One truth that this paper has yet to explore concerns itself with nuclear waste management. Through listening to public statements made by Indigenous groups time and time again, we learn that the current approach to nuclear waste management "conflicts with Indigenous spiritual principles that command a more relational and holistic appreciation of lived reality...by homogenizing the nuclear fuel chain into one national narrative" (Weatherdon). By positioning Indigenous communities as just a part of the general "public," entire groups of people are forced to give up their land "for the national interest…[which] deflects the sovereignty of American Indians and hails them as assimilated members of the US public" (Endres, Communication and Critical/Cultural Studies). As a result, the burden of opposing the colonial expansion of nuclear power is shifted onto the shoulders of the Indigenous people whose lands are being stolen, as they must "prove that their concerns outweigh the national interest as defined by the federal government...a nearly impossible task, especially when American Indian people are subsumed in the national interest" (Endres, Communication and Critical/Cultural Studies). As a result, not only have the truths told by Indigenous communities been dismissed as simply "public opposition," but they have also been ignored without consequence. The very policies and legal documents permitting the operation of nuclear power plants to continue do not acknowledge these truths or hold accountable those with the power to make the necessary changes to them. In order for us to break the cycle of colonialism furthered by the nuclear power industry and shift over to a more inclusive process of truth-telling, we must recognize the role that spirituality can play. "Far from being an entirely private, asocial, and individualistic affair, [spirituality] can take on an expansive role in the public arena" (Weatherdon). An eco-justice oriented theology that values and respects the human relationship with nature, as described by Indigenous spirituality practices, also must incorporate truth-telling by the voices of those who have been silenced for far too long. Therefore, spirituality can and should play an integral role not only in the public sphere, but the political realm as well. This distinction is important because public participation is different from actually being in the rooms where the decisions are made. We must bring these truths into all aspects of the system's process in order to begin to make the changes necessary for Indigenous voices and practices to be heard, valued, and actually considered.

Environmental Justice Solutions

When thinking about our role in decarbonizing the energy sector without further colonizing Indigenous populations, we cannot simply blame nuclear power plants (and the like) for the situation we find ourselves in. While it is important to recognize and take appropriate action due to the role that nuclear power systems have played in further oppressing already marginalized communities, it is necessary that we look inwards to identify the many ways in which our actions (intentionally or not) colonize them as well.

As we continue to move away from fossil fuel-based energy sources and transition to renewable energy alternatives in order to help address the climate emergency we are facing, the emphasis we place on listening to Indigenous voices is more important than ever. This is because "Indigenous territories host big renewable energy projects and other 'clean energy' such as large hydro dams, windmill farms, and geothermal plants...these projects have resulted in conflicts, displacements, destruction of livelihoods, and have violated Indigenous Peoples' rights and undermined their self-determined development" (Carling). Therefore, even though moving away from fossil fuels and towards renewable energy technologies is a step in the right direction for our healing climate, we are still not centering the voices of those most impacted by our efforts. If we aim to do more than recognize the inherent and unalienable rights of Indigenous communities within the energy sector and beyond, it is necessary that we look in the mirror (inwards) - at who is doing the "innovating." Three different innovation approaches, from most common to least common (but most needed), are described by Roberto Borrero as pro-Indigenous (for Indigenous Peoples), para-Indigenous (with Indigenous Peoples), and per-Indigenous (by Indigenous Peoples). "Pro-Indigenous innovations derive from outside of the targeted communities but are undertaken on behalf of Indigenous Peoples; para-Indigenous initiatives are undertaken alongside Indigenous Peoples' communities; and per-Indigenous efforts mark innovations around processes, new products, and business models that are devised by Indigenous Peoples with reference to their own self-defined needs and wants" (Borrero). Indigenous-led and community-based renewable energy projects have shown promising results around the world already: from the Cordillera region of the Philippines where a community-based hydroelectric

power system has flourished due to being sustainably financed through contributions from the local community, to the Northern Territory of Australia where a community-based solar project has allowed several Indigenous communities to return to their beloved land and re-establish self-sufficiency. Most importantly, not only does the climate and our shared environment benefit from these Indigenous-led renewable energy projects and efforts, but their voices can finally be at the center - heard and valued. It is only by allowing Indigenous Peoples and other marginalized communities to determine for themselves what is best for them, and importantly, ensuring that they have all that they need to be able to accomplish their goals, that we can begin to see the changes we all hope for.

Bibliography

Alldred, Mary, and Shrader-Frechette, Kristin. *Environmental Injustice in Siting Nuclear Plants*. Environmental Justice, 2009.

Borrero, Roberto Múkaro. *Innovation and Technology for Indigenous Peoples*. United Nations Department of Economic and Social Affairs, 2013.

Carter, Christopher. *Racial Formation Theory & White Racial Frame*. PowerPoint Presentation (Structural Racism), 2020.

Carling, Joan. *Doing it Right: Sustainable Energy and Indigenous Peoples*. Indigenous Peoples Major Group for Sustainable Development, February 2018.

Endres, Danielle. *From Wasteland to Waste Site: The Role of Discourse in Nuclear Power's Environmental Injustices*. Local Environment, 2009. 917-937.

Endres, Danielle. *The Rhetoric of Nuclear Colonialism: Rhetorical Exclusion of American Indian Arguments in the Yucca Mountain Nuclear Waste Siting Decision*. Communication and Critical/Cultural Studies, 2009. 49.

Feagin, Joe. *The White Racial Frame ed. 2.* Taylor & Francis, 2013. Preface, 3.

Gundersen, Arnie. *San Onofre's Steam Generators: Significantly Worse Than All Others Nationwide*. Friends of the Earth, 2012.

Kyne, Dean, and Bolin, Bob. *Emerging Environmental Justice Issues in Nuclear Power and Radioactive Contamination*. International Journal of Environmental Research and Public Health, 2016.

Jenkins, Alvarez, and Sarah Marie Jordaan. *Unmanaged Climate Risks to Spent Fuel from U.S. Nuclear Power Plants: The Case of Sea-Level Rise*. Energy Policy, 2019.

Middleton, Nick. *The Global Casino: An Introduction to Environmental Issues ed. 5*. Routledge, 2013.

Nessan, Craig L. *Calling a Thing What It Is: Confronting the American Genocide of Indigenous Peoples*. Currents in Theology and Mission, 2020. 23-28.

Omiland, Michael, and Winant, Howard. *Racial Formation in the United States ed. 3*. Routledge, 2015.

Pao-Tsin, Kuo. *Biological Assessment for the Effects of the Continued Operation of the San Onofre Nuclear Generating Station on Threatened or Endangered Marine Species*. United States Nuclear Regulatory Commision, 2005.

Walker, Gordon. *Environmental Justice: Concepts, Evidence, and Politics*. New York: Routledge, 2012. 11, 39-68.

Weatherdon, Meaghan Sarah. *Indigenous Knowledge and Contested Spirituality in Canadian Nuclear Waste Management*. Journal for the Study of Religion, Nature and Culture, 2017. 86-105.

Reflection on Research Process

Through weaving together a variety of credible sources, my paper not only evaluated the environmental science and environmental ethics components behind the nuclear power industry, but it also incorporated indigenous spirituality practices and explored indigenous-led solutions to the issue of contemporary nuclear power plant implementation. Each segment of my research paper built upon the other and was therefore turned in cumulatively throughout the semester for feedback and suggestions from my professor for the course, Dr. Christopher Carter.

To begin my research process, I located and thoroughly read published academic texts related to the environmental issue of nuclear power from sources such as our University's ATLA Religion Database and EBSCO Library Publications, Google Scholar and Elsevier ScienceDirect, as well as the works cited portions of the most promising texts from these sources. I also read Dr. Carter's recommended texts: Chapters 7, 17, and 18 of *The Global Casino: An Introduction to Environmental Issues* by Nick Middleton, Chapter 4 of *Racial Formation in the US* by Michael Omiland and Howard Winant, the Preface and Chapter 1 of *The White Racial Frame* by Joe Feagin, *The White Savior Industrial Complex* by Teju Cole, and *Environmental Justice: Concepts, Evidence, and Politics* by Gordon Walker. With the knowledge I gained from carefully reading all of these academic resources, I developed a bibliography to identify some of the main texts that I would engage with closely in my paper. I then crafted several iterations of a thesis statement and abstract, as well as an introduction section. After setting up a virtual meeting with Dr. Carter to review my writing, I made corrections and changes based on his feedback and suggestions. I then moved on to writing the second and third segments of my paper, which were the environmental science and environmental justice components of nuclear power plants.

As I approached writing the environmental science portion of my research paper, I utilized the scientific knowledge I gained in my Integrated Approach to Energy class from the previous semester along with additional resources from the U.S. Nuclear Regulatory Commission (NRC), the International Journal of Environmental Research and Public Health, and texts found from Google Scholar, Elsevier ScienceDirect, and our University's EBSCO Library Publications database.

Moving on to the environmental justice portion of my paper, my primary focus was to highlight Indigneous perspectives on nuclear power plants, on their historic as well as contemporary waste management practices, and on the industry as a whole. I chose to focus on Indigenous Peoples because my own spirituality aligns with the practices and beliefs of many Indigenous communities, and through my research for this paper, I found that Indigenous Peoples are among the most affected by the nuclear power industry. Through my research for this segment, I located a very impactful paper called *Indigenous Knowledge and Contested Spirituality in Canadian Nuclear Waste Management* written by Professor Meaghan Weatherdon. When I next met with Dr. Carter, I shared how valuable her research and resulting work was to my paper, and he informed me that she is an Assistant Professor of Religious Studies at USD specializing in Indigenous Religions and Spiritualities of North America. In order to develop a deeper understanding of her text given its importance throughout my paper, I reached out to Professor Weatherdon through an email and we met to discuss her research process as well as questions I had regarding her findings. Our discussion largely influenced my approach to the final component of my paper: eco justice solutions to the issue of nuclear power.

Through the conversation I had with Professor Weatherdon, I learned that the vast majority of modern energy projects happen at the expense of Indigenous Peoples, but if we can learn from and invest in some of the smaller-scale Indigenous-led energy movements, then we can begin to address the issues discussed in both of our papers. With this idea in mind, I decided to search for supporting texts and located a couple from the United Nations Department of Economic and Social Affairs as well as the Indigenous Peoples Major Group for Sustainable Development, one of nine nationally recognized Major Groups that is able to participate in the processes of the United Nations Sustainable Development Goals (SDGs) at a global level. All together, the academic and organizational resources that I found using dependable databases and utilized with guidance from multiple Professors at USD, culminated in a well-supported research paper that exposes nuclear power plants for all that they perpetrate.